

CHAPTER 208
WATER HEATER SUPPLY BOILERS

[Prior to 9/24/86, Labor, Bureau of [530]]
[Prior to 1/14/98, see Labor Services[347] Ch 47]

875—208.1(89) Scope. This chapter establishes minimum requirements for installation, operation, and inspection of water heaters which are fired with gas, oil, electricity, solid fuel, or other fuel when any of the following limitations are exceeded:

1. Heat input 50,000 Btu's per hour.
2. Water temperature of 210° F.
3. A water containing capacity of 50 gallons.
4. Pressure not exceeding 160 psig.

Coverage is for those water heater supply boilers supplying potable hot water for other than space heating. Linings are limited to porcelain enameled, copper, glass lined, galvanized, fluorocarbon polymer, amine or polyamine epoxy or cement lined.

875—208.2(89) Lining.

208.2(1) Glass or galvanized lined water heater supply boilers shall be provided with cathodic protection with a cored magnesium anode having a weight of magnesium of not less than 25 grams for each square foot of inner vessel area, and the anode shall be electrically grounded to the vessel.

208.2(2) Cement lining in water heater supply boilers shall be lined with a low soluble hydraulic cement lining material containing not less than 25 percent silicon and not more than 35 percent calcium oxide.

875—208.3(89) Temperature/pressure relief valves.

208.3(1) Water heater shall have at least one officially rated temperature/pressure relief valve of the automatic resetting type set to relieve at or below the maximum allowable working pressure of the heater. Temperature/pressure relief valves shall have pop action when tested by steam. When more than one temperature/pressure relief valve is used on water heater supply boilers, the additional valve or valves shall be officially rated and may be set within a range not to exceed 10 percent of the set pressure of the first valve. Temperature/pressure relief valves shall be spring-loaded. Temperature/pressure relief valves shall be so arranged that they cannot be reset at a higher pressure.

208.3(2) No materials subject to fail due to deterioration or vulcanization when subjected to saturated steam temperature corresponding to capacity test pressure shall be used for any part of a temperature/pressure relief valve.

208.3(3) No temperature/pressure relief valve shall be smaller than ¾ inch nor larger than 4½-inch standard pipe size. The inlet opening shall have an inside diameter approximately equal to, or greater than, the seat diameter. The minimum opening through any part of the valve shall not be less than ½-inch diameter or its equivalent area.

208.3(4) The required relieving capacity, in Btu per hour, of the pressure relieving device or devices on a water heater supply boiler shall be equal to or greater than the maximum input Btu rate. The relieving capacity for electric water heater supply boilers shall be 3,500 Btu's per hour per kilowatt input.

208.3(5) When operating conditions are changed or additional heater heating surface is installed, the valve capacity shall be increased, if necessary, to meet the new conditions and shall be in accordance with subrule 208.5(1). Additional valves required may be installed on the outlet piping provided there is no intervening valve.

208.3(6) Temperature/pressure relief valve capacity for each water heater supply boiler shall be such that, with the fuel burning equipment installed and operated at maximum capacity, the pressure cannot rise more than 10 percent above the maximum allowable working pressure.

875—208.4(89) Mounting temperature/pressure relief valves. Temperature/pressure relief valves shall be connected to the top of heaters or directly to a tapped or flanged opening in the heater by a short nipple, to a Y-base, to a valveless steam pipe between adjacent heaters, or to a valveless header connecting steam or water outlets on the same heater. Temperature/pressure relief valves shall be installed with their spindles vertical or horizontal. The centerline of the temperature/pressure relief valve connection shall be no lower than 4 inches from the top of the shell. The temperature sensing element shall be in the hottest portion of water heater supply boiler.

875—208.5(89) Requirements for common connection of two or more valves.

208.5(1) When a heater is fitted with two or more temperature/pressure relief valves on one connection, this connection shall have a cross-sectional area not less than the combined areas of inlet connections of all the safety relief with which it connects.

208.5(2) When a Y-base is used, the inlet area shall not be less than the combined outlet areas. When the size of the heater requires a temperature/pressure relief valve larger than 4½-inch diameter, two or more valves having the required combined capacity shall be used. When two or more valves are used on a heater, they may be single, directly attached, or mounted on a Y-base.

875—208.6(89) Prohibited mountings. Temperature/pressure relief valves shall not be connected to an internal pipe in the heater or a cold water feed line connected to the heater.

875—208.7(89) Shutoff valves prohibited. Shutoff valves shall not be placed between the temperature/pressure relief valve and the boiler or on discharge pipes between such valves and the atmosphere.

875—208.8(89) Thermal expansion. When water supply to water heater supply boilers exceeds 75 percent of the design pressure of the heater, a pressure reducing valve is required. If a system is equipped with a check valve or pressure reducing valve in the cold water inlet line an airtight expansion tank or other suitable air cushion shall be installed. If an expansion tank is provided, it shall be constructed in accordance with the ASME Code, Section VIII, Division 1 in effect when installed, for a maximum allowable working pressure equal to or greater than the water heater supply boiler. Except for prepressurized tanks, provisions shall be made for draining the tank without emptying the system.

875—208.9(89) Stop valves. Stop valves shall be used in each supply and return pipe connections of multiple water heater supply boiler installations to permit draining the heater without emptying the system.

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